

Applicants: Hohenthaler, et al.
Serial No. 10/627,238
Attorney Docket No.: 13430-US
16 January 2007 Amendment in Response to 13 July 2006 Office Action
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Amendments to The Claims:

The listing of claims below will replace all prior versions and the listing of claims in the application:

1. (currently amended) A process for applying a catalyst ink onto a substrate, said process comprising the steps:

(a) coating a substrate with a catalyst ink under conditions of controlled humidity and temperature to form a deposited catalyst ink on said substrate, wherein said catalyst ink comprises an electrocatalyst, an ionomer and water;

(b) leveling the deposited catalyst ink under conditions of controlled humidity and temperature to form a catalyst-coated substrate; and

(c) drying the catalyst-coated substrate at an elevated temperature

wherein the coating step (a) occurs in a coating compartment and the leveling step (b) occurs in a leveling compartment.

2. (original) The process according to claim 1, wherein said catalyst ink further comprises an organic solvent.

3. (currently amended) The process according to claim [[2]] 1, wherein said catalyst ink further comprises a surfactant with a vapor pressure between 1 and 600 Pascal.

4. (currently amended) The process according to claim [[3]] 1, wherein the substrate is selected from the group consisting of a hydrophobic polymer film, a transfer tape material, a paper-based material, a decal substrate, a metal substrate tape, an ionomer membrane, a carbon paper, a carbon fiber substrate, a carbon cloth, a woven or non-woven carbon mesh, a needled felt, a knitted fabric, and a carbon felt and a paper-type material.

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5. (original) The process according to claim 4, wherein said substrate is present in individual sheet or in continuous roll form.
6. (currently amended) The process according to claim 1, wherein the coating occurs in a coating compartment and the leveling occurs in a leveling compartment, and wherein the humidity in the coating compartment is maintained at 60 to 100 % relative humidity and a temperature in the range of 10 to 60°C, and the humidity in the leveling compartment is maintained at 60 to 100% relative humidity and at a temperature in the range of 10 to 60°C.
7. (currently amended) The process according to claim [[6]] 1, wherein the leveling of the deposited catalyst ink in leveling step (b) is performed for a period of 1 to 10 minutes.
8. (currently amended) The process according to claim [[7]] 1, wherein the drying step (c) of the catalyst ink is performed at a temperature in the range of 40 to 150°C for 1 to 10 minutes.
9. cancelled.
10. cancelled.
11. (withdrawn-currently amended) A composition comprised of a catalyst-coated membrane, wherein said catalyst-coated membrane is comprised of comprising the catalyst-coated substrate produced according to the process of claim 1.
12. (withdrawn-currently amended) A composition comprised of a catalyst-coated gas diffusion substrate, wherein said catalyst-coated gas diffusion substrate is comprised of comprising the catalyst-coated substrate produced according to the process of claim 1.
13. (withdrawn-currently amended) A composition comprised of a catalyst-coated polymer film wherein said catalyst-coated polymer film is comprised of comprising the catalyst-coated substrate produced according to the process of claim 1.

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14. (withdrawn-currently amended) A membrane-electrode-assembly comprising the catalyst-coated membrane of claim [[10]] 11.

15. (withdrawn-currently amended) A membrane-electrode-assembly comprising the catalyst-coated gas diffusion substrate of claim [[11]] 12.

16. (withdrawn-currently amended) A membrane-electrode-assembly comprising the catalyst-coated polymer film of claim [[12]] 13.

17. (withdrawn) A method of using the membrane-electrode-assembly of claim 14, comprising operating a PEMFC or DMFC fuel stack, wherein said fuel stack is comprised of said membrane-electrode assembly.

18. (withdrawn) A method of using the membrane-electrode-assembly of claim 15, comprising operating a PEMFC or DMFC fuel stack, wherein said fuel stack is comprised of said membrane-electrode assembly

19. (withdrawn) A method of using the membrane-electrode-assembly of claim 16, comprising operating a PEMFC or DMFC fuel stack, wherein said fuel stack is comprised of said membrane-electrode assembly.

20. (new) The process according to claim 1, wherein the coating of the substrate is applied by screen printing, stencil printing, offset printing, transfer printing, doctor blading, brushing, spraying, or other known coating techniques.

21. (new) The process according to claim 1, wherein the coating step (a) and the levelling step (b) are performed in one large compartment comprising a coating section and a levelling section.